

slightly tinged with yellow above, short on disc of mesothorax and sparse on disc of metathorax. Wings hyaline, veins brown. Legs black, more or less brownish on tibiae and tarsi, the four anterior tibiae white at base and on the anterior pair extending down a short distance in front is a brownish-yellow line; pubescence whitish tinged with yellow on tarsi beneath. Abdomen black, shining, almost nude except at base where there are some white hairs and at apex where the pubescence is rather dense; yellow bands on segments 1-4, those on 1-2 broadly interrupted on the disc and on 3-4 very slightly so; all are somewhat margined on the lateral apical portions. Venter black, apical margin of the segments brownish.

Habitat. Visalia, Cal. (H. O. Woodworth), May 9. One specimen.

6. *Calliopsis anthidius* n. sp.—♀. 10 mm. Black, abdomen with narrow yellow bands broadly interrupted on the sides. Head black, very finely and densely punctured on vertex; clothed with whitish pubescence, tinged with yellow above; all of the face beneath the antennae except three small

spots on clypeus near the base and one on the labrum, and mandibles except tips, yellow; the yellow on the sides of the face extends up a little higher than the antennae. Antennae black, flagellum pale yellowish beneath. Thorax entirely black, clothed with a dense whitish pubescence which has a brownish-yellow tinge above. Wings smoky becoming darker toward apical margins; veins black. Legs clothed with short white pubescence; black except a line on the anterior femora and on all the tibiae in front (interrupted on middle of posterior pair) and the tarsi entirely except a narrow black line on posterior pair behind, and the claws which are more or less brownish, yellow. Abdomen black, clothed with a very short pale pubescence; segments 1-5 with narrow yellow bands each slightly interrupted on the middle and broadly so latterly forming thus four elongate spots on each segment, those on the sides being the broadest. Venter black.

Habitat. Tulare, Cal. (H. O. Woodworth), May 10. One specimen.

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE.—IV.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Therina eudropiaria Grt. and Rob.—The mature larva has been described by Goodell (Can. ent. xi, 194). His description, though short, is correct, if the structures that he calls "tubercles" be understood to be low rounded prominences of the skin and the words 6, 8 and 7th segments be changed to 6, 8 and 9th. Further as Goodell does not count the head as joint 1, his numbering of the segments should be increased by one in each case to correspond with mine.

Egg.—Several together, usually in a straight row of 5 to 9, sometimes more; irregularly elliptical, scarcely flattened, one end distinctly truncate, a little convex with a

rounded rim. Neatly, distinctly reticulate, the cell areas resembling round pits, the pitting extending also over the truncate end. Slightly bluish green, shining, soon turning dull reddish with a dark spot on the truncate end. Size .6 x .4 x .3 mm.

Stage I. Head round, pale brown; width about .3 mm. Body whitish translucent, a rather broad pale cinerous subdorsal band, leaving the dorsal and lateral areas pale. Setae fine, pointed, white, obscure. Appearance pale grayish, obscurely marked. After eating they became translucent green, the head brown, no marks.

Stage II. Head round, slightly bilobed,

pale brown; width .5 mm. Body smooth, slender, whitish green, finely creased annulate, not shining, no marks, no projections.

Stage III. Head round, slightly bilobed, broad, green, slightly brown dotted on the sides of the lobes; width .9 mm. Body smooth, green, a little whitish, especially on the substigmatal fold above which is a faint darker green band on joints 3 to 13, or this band may be blackish; spiracles black. The segments are annulate on the anterior half ventrally. The larvae sit at an angle with a supporting thread from the mouth.

Stage IV. Head rounded, bilobed, green, a reddish suffusion on the side; width 1.3 mm. Body green, sordid on the thorax and joint 13, elsewhere opaquely yellowish green; a brownish suffusion on joint 10 stigmatally; spiracles on joints 5 to 9 in black patches. The elongated central segments are folded-wrinkled on the posterior third; lateral fold rather distinct. The skin is smooth, almost without marks.

Stage V. Head as before, the brown patch on the side larger; width 1.8 mm. A stigmatal shade on joints 10 to 13 and patches on 6 and 7 distinct. Tubercle ii of joints 7 and 10 a little enlarged and shaded with brown. Otherwise smooth, opaque yellowish green, a little shaded with brown; a brown dot on joint 3; tubercle iv black the whole length; joint 8 more or less distinctly colored. There is much variation in different larvae in the amount of brown; the poste-

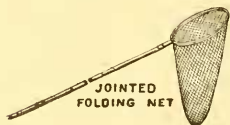
rior end, joints 10-13, may be all brown and a large patch on joints 6 and 7.

Stage VI. Head green only centrally and on the vertex, heavily shaded with purplish brown over the side of each lobe, darkest posteriorly; rounded, bilobed, higher and wider than joint 2; width 2.5 mm. Body cylindrical, smooth; a collared elevation on the dorsal half of joint 7 (tubercles ii and iv); ii and iv of joint 10 and iv of joint 6 with slight elevations or joint 6 even collared on the ventral half; the dorsal tubercles all a little prominent especially on joints 3, 9 and 10. Color dull, not shining; under ground green, all shaded with purplish brown, the exact amount varying. Joints 10 to 13 are nearly entirely shaded, the venter of these and of 2 to 4 contrastingly pale green. There is a dark spot on tubercle iv of joints 5 to 9 with a tendency to transverse bands. Tubercles dark, relieved by white patches in the dark and prominent parts. Spiracles black, ringed with whitish outer shades. Anal plate rounded; two subanal prongs. The larva resembles a twig that is partly green. One example was all brown except on the face and dorsally on joints 2 and 3.

Eggs were obtained at Brookhaven, Long Island, N. Y., late in June and the larvae spun towards the end of August, passing the winter as pupae. Fully grown larvae were found at Morris Plains, N. J.

Food plants. Red and white oaks and chestnut.

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